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INTEGRATION OF AGRICULTURAL AND LIVESTOCK ACTIVITIES IN AFRICA

(item 8 of the Provisional Agenda)

1. Aware of the serious problems with which the African continent is faced, the Food and Agriculture Organization is endeavouring within the limits of available resources to give priority attention to Africa. The integration of agricultural and livestock activities in Africa is of great interest to FAO. To make progress in this subject it is necessary to raise questions and attempt to provide answers, or to stimulate further questions.

2. The title of this session seems to imply two things: firstly, that there has been no integration of agricultural and livestock activities either now or in the past and secondly, that integration is a GOOD THING.

3. With regard to the first, one has to admit that examples of true integration in Africa are remarkably few. With regard to the second point, clearly there could be advantages to the farmer:

- increased and more regular income (if markets are available);
- an improved diet (if cost in terms of labour required, and income forfeited is satisfactory in terms of greater security by diversification of output, if food preferences change);
- better ways for the use of manure (but this is sometimes a source of fuel for cooking);
- better utilisation of family manpower and less arduous labour (if animal traction is used for crop cultivation, carriage of water or marketable produce;
- in utilisation of crop residues for productive purposes.

Advantages to each nation include:

- better use of natural resources
- improved productivity
- preservation of natural resources
- legitimate land settlement and the possibility of taxation
- import substitution
- export possibilities

<u>What factors militate against integration?</u>

These include:

- Traditional patterns of subsistance. There are still areas in Africa where large domestic stock are unknown to the people and where subsistance means searching for the necessities of life for the human and his livestock (water, food/grazing);

- the environment, particularly, soil, rainfall (quality and distribution). A key factor in the availability of livestock feed are the length and reliability of rainfall. Long dry seasons or unreliability of rainfall imply fodder reserves and preservation of surplus to enable livestock to survive and produce;

- disease, onchocerciasis, malaria, schistosomiasis in the human, trypanosomiasis, rinderpest, internal parasites, etc. in livestock;

- land tenure systems. Investments for satisfactory integration of livestock require sufficient security of land tenure to justify expenditure;

- availability of credit.

How can governments assist integration

4. Firstly, it is essential that the question of decision-making is clearly understood. It is the individual (farmer, family head) or the group leader (Chief, clan head, etc.) who finally decides what food he will eat, what crops he will grow or what livestock he keeps and what method he will use, and how he will spend his income. The individual is the decision maker.

5. It is governments that must influence this decision-making process. This can be done in a variety of ways and combination of ways falling under the heading of incentives. Firstly, however, is the question of how to influence the subsistence farmer to enter the cash economy. Once a cash/market economy has been established ensuring suitable conditions for its enhancement becomes possible - but never simple. Among the most important factors are:

- ensuring adequate returns to the farmer (price incentives);

- ensuring sufficient inputs to enable the farmer to take advantage of the possible returns. This implies an effective extension service to provide sound technical advice, and make available inputs of seeds, fertilisers, pesticides, drugs and vaccines at fair prices (or on credit) and at the correct times.

6. An effective extension service requires well-trained highly motivated staff with well thought-out programmes. In this context factors to be considered include ineffective use of trained manpower, outright loss to non-agricultural pursuits or a "brain drain" to other countries or even the international organizations. Loss of manpower tends to be more severe in Africa because of the very small number initially trained (e.g. veterinaries 1.2 per cent of world total 1982).

7. Some other points must be emphasized in regard to extension work. Firstly, the subject is inextricably linked with communication - between governments and their citizens - between the extension worker and the farmer. Thus literacy and elementary education must be a priority prerequisite. Associated with this is the importance of women who constitute half the population and who influence the decision-making of the husband or family. Secondly, it cannot be over emphaized that the extension advice given must be practical, sound and suited to the prevailing local conditions. Unless the advice given is certain to produce results it is not reasonable to expect the small farmer whose margin between starvation and survival is very narrow, to adopt a new practice which could leave him starving or at least worse off than before. In this respect, it is often said that extension advice for livestock owners must be virtually certain to produce an increase in returns/income of at least 20 per cent.

8. The various studies that have been undertaken by FAO on agro-ecological zones and in collaboration with UNEP/ and IIASA on population supporting capacity and the tsetse infested areas could be used to quantify where integration of crops and livestock is most likely. Clearly the arid and semi-arid areas which do not support crop growth must be excluded. It is at the interface of the semi-arid and sub-humid zones that sedentarisation of the pastoral peoples is of major importance.

9. Using available agro-ecological zone data it can be shown that the areas where crops and livestock could be integrated are largely (87-94 per cent) in the 37 tsetse infested countries and furthermore in the tsetse infested areas (81.5 per cent). Other important areas are where large scale irrigation takes place. The several schemes for development of river basins and erection of dams could offer priority areas for integration of livestock and agriculture.

10. Recognising the importance of this subject FAO will be publishing in the near future a study on integrating crop and livestock production in West Africa. The study material was prepared for FAO by Dr. R. Von Kaufmann, leader of the ILCA subhumid zone team in Nigeria, Dr. P.N. Okigbo, Deputy Director of IITA, Ibadan, Nigeria, and Dr. E.N.W. Ofoche, formerly of the University of Ghana.

11. It brings together information relevant to prospects for developing integration of crop and livestock production, from the starting points of the pastoral, arable, and plantation systems of production prevailing in West Africa. It concentrates mainly on the subhumid (1250-1500 mm annual rainfall) and humid (1500-2000 mm annual rainfall) zones which have high potential for both crop and livestock production.

12. The information is drawn from experience gained by the two CGIAR institutes, ILCA and IITA, which have relevant research programmes in Nigeria. Nigeria encompasses all the West African ecological zones and has been confronted earlier than other West African countries with a population density which creates competition for land and the need to replace traditional subsistence livestock rearing and crop farming practices with more intensive systems. The United Nations medium-growth population projections indicate that the fastest rates of demographic growth will be in Africa where the population is expected to triple between 1980 and 2025. It is thought that the Nigerian experience will have increasing relevance to other African countries with similar ecological conditions over the next decades. It is also clear from these projections that there is a time limit on the opportunity to influence the development of crop and livestock production in these areas which have high potential but which, thanks largely to tsetse challenge, are not yet heavily populated.

13. Pastoralists have been economically, socially and spatially related to settlements of arable farmers and there appears to be good prospects for achieving closer integration of crop and livestock production by building upon this interdependence. In Nigeria Fulani pastoralists are now being taught the benefits and practice of feeding supplements based on improved crop residue utilisation. They are also learning simplified low-cost techniques for establishing dry season fodder production on fallow lands. Arable farmers are willing to allow their fallow lands to be used for this purpose at present which may help reduce the soil recovery intervals, but this situation could change as population pressures increase.

14. It has been estimated that over half of the Fulani in northern Nigeria are already settled or semi-settled. These people have either adopted or have increased their farming activities and have demonstrated their capacity for change by their willingness to adopt the cropping techniques used by local crop farmers. A major constraint to progress towards more intensive production systems and closer integration of their livestock and crop farming is the fact that the pastoralist communities have no security of land tenure. ILCA's studies have shown that a large proportion of the cattle population in the subhumid zone now tend to stay within that zone throughout the year whereas in the past they would return to their tsetse-free wet season grazing lands in the drier Sudan zone. Government authorities are now recognising the need to provide settlement with the security of tenure since this is a prerequisite for settlement and investment in infrastructural improvements.

15. An important impediment to settlement has been legislation which prohibits arable farming within the grazing reserves which the pastoralist relies on increasingly for feed for his cattle. The need to change this legislation is gaining recognition and new pilot schemes are now commencing in Nigeria. These provide selected Fulani families with 50-year leases of plots of approximately 200 hectares of which they will be encouraged to cultivate up to 5 per cent.

16. Service centres located within or near the reserves will provide access to credit and market outlets will be ensured. Government support will be designed to help integration of crops and livestock production within the leasehold blocks and ultimately to run down the level of dependence on extensive communal grazing. Initial husbandry innovations include supplementary feeding of the best breeding cows which will be kept within the leasehold blocks with locally available agricultural by-products and access to cultivated fodder legume stands in the dry season.

17. In traditional West African arable farming, livestock only feature in the homesteads and adjacent areas where they graze the fallows and the residues on harvested fields. To date the introduction of animals into cropping systems has been mainly limited to small farmer fattening programmes and the use of draught oxen. Current work on intercropping, crop rotations, minimal and zero tillage, live mulch crops, and alley cropping with leguminous shrubs and browse plants is opening up new prospects for integrating livestock production more closely into arable cropping. These systems are being examined by ILCA in collaboration with IITA at Ibadan, but farming systems research by national institutions requires to be extended and accelerated.

18. In rain forest areas one of the major constraints to ruminant livestock production is the high cost of bush clearing and the limited availability of natural grasslands. To expand ruminant livestock production quickly in these areas it will be necessary to fit pastures or fodder crops into areas which have been cleared for other purposes where this can be done without unacceptable reduction in yield of the primary crop. The establishment and grazing of pastures under plantation crops has been practiced on a limited scale for many years and much ad hoc information has been collected on the technical and economic advantages. It is now well established that many tree crops afford a highly favourable microclimate for efficient grazing by cattle which generally require shade for much of the day. Shade tolerant grasses and legumes have been identified and risks to young tree seedlings have been studied for a number of tree crops.

19. The publication presents a summary of this information and indicates the scope for integrating meat and milk production under tree crops.

20. Finally, it should be recalled that in evolutionary terms in the great agricultural countries of the world there has been a drift of population from the rural to urban areas. As agricultural production has increased in efficiency fewer farmers in specialised units have tended to become the norm. It is possible that a similar evolutionary cycle will occur in Africa, unless programmes aimed at encouraging rural employment and integration of crops and livestock can be effectively implemented.